

CLAIMS:

1. A non-reciprocal circuit element having a plurality of strip conductor elements (2) insulated electrically from one another, which conductor elements are embedded in a multilayer core (3) of ferrimagnetic material and are arranged in superposed conductor planes in such a way that the conductor elements (2) cross over one another in at least one crossover area (4, 5), characterized in that the core (3) comprises, at least in the area (4, 5) where the conductor elements (2) cross over one another, hard magnetic material, which is permanently magnetized in a spatial direction perpendicular to the conductor planes.
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2. A non-reciprocal circuit element as claimed in claim 1, characterized by an upper and a lower outer layer (7, 8) of soft magnetic material.
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3. A non-reciprocal circuit element as claimed in claim 2, characterized in that the upper and/or lower outer layers (7, 8) are separated from the core (3) each by an electrically conductive separator layer (14).
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4. A non-reciprocal circuit element as claimed in one of claims 1 to 3, characterized in that the conductor elements (2) cross over one another in pairs at an angle of 120°.
- 20 5. A non-reciprocal circuit element as claimed in one of claims 1 to 4, characterized by two spatially separate crossover areas (4, 5) of the conductor elements (2), the hard magnetic material of the core (3) being oppositely magnetized in the respective crossover areas (4, 5).
- 25 6. A method for producing a non-reciprocal circuit element (1), having the method steps of:
 - a) cutting foils of unfired ceramic substrate to size,
 - b) producing plated-through openings (15) in the foils,
 - c) filling the plated-through openings (15) with conductor paste,

- d) printing strip conductor elements (2) on the foils,
 - e) drying the foils,
 - f) stacking the foils into a foil stack,
 - g) compacting the foil stack,
- 5 h) sintering the foil stack,
characterized in that the foil stack comprises a plurality of inner foils (3) of hard magnetic material and at least one upper and at least one lower outer foil (7) of soft magnetic material, the strip conductor elements (2) being printed on the inner foils (3) in method step d) in such a way that conductor elements (2) superposed in the foil stack cross
10 over one another in at least one crossover area (4, 5).

7. A method as claimed in claim 5, characterized in that, in the foil stack, the outer foils (7, 8) are separated from the inner foils (3) by in each case an electrically conductive separator layer (14).

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8. A method as claimed in one of claims 5 and 6, characterized in that the sintered foil stack is magnetized in a method step i) in a direction perpendicular to the foil planes.